ABORIGINAL BONE IMPLEMENT FROM FOSSIL BONE BED, TASMANIA

by

EDMUND D. GILL,

National Museum of Victoria.

Manuscript received 4/8/67. *Published 29/3/68*

Flowery Gully is a small settlement on the west side of the Tamar Estuary, about four miles south of Beaconsfield, and 22 miles (in a direct line) northwest of Launceston. Gordon Limestone of Ordovician age forms the bedrock, and this has been quarried in a number of places. When visiting Launceston in 1952, it was reported to me that fossil bones had been discovered in Beams' Quarry at Flowery Gully (See Plate 1). The Director (then Miss I. J. Thomson) and Anthropologist (Mr. W. F. Ellis, now Director) of the Queen Victoria Museum and Art Gallery took me to the site S.E. of Mr. R. Beams' house and east of the road to Beaconsfield. The locality is mapped as B.L.P. Quarry by Hughes (1957).

The quarry revealed a face of some 20 feet of crystalline limestone with karst features. Stalactites, flowstone and other forms of secondary carbonate were noted. At the base of the section revealed in the quarry wall was a formation of red earth. Between five and six feet above the quarry floor in this formation was a horizontal bed containing considerable numbers of animal bones and some charcoal. The cave earth was present both above and below the bone bed. The bed was too even in fabric and too horizontal to be a collapse deposit. The occurrence was interpreted as a fissure or cave in which the bones had accumulated initially or had been washed in. The former explanation was considered more likely because of the wealth of bones limited to a narrow stratum. The structure of the deposit suggested an aboriginal midden rather than an animal lair, but the nature of the occurrence could not be determined in the brief time available. A sample of the deposit was taken, and washed upon return to Melbourne. This revealed an aboriginal bone implement, the occurrence of which was reported to the Queen Victoria Museum at Launceston with the recommendation that more of the deposit be collected. This recommendation was carried out but no further implements were found. However, the bones are beautifully preserved, so palaeontologically valuable. A photograph in the Hobart Mercury of June 4th, 1951, shows Mr. E. O. G. Scott and Mr. T. E. Burns collecting fossil bones in the cave before it was disturbed. The sample collected by me was from a section through the cave deposits that resulted from quarrying operations.

FOSSILS

Having learnt that Mr. E. O. G. Scott of Launceston had already made a collection of bones from this site, I invited him to prepare a faunal list from his collection, the fossils in the Queen Victoria Museum, Launceston, and those in the National Museum of Victoria, Melbourne. His determinations are given below, in addition to some further determinations by Mr. J. A. Mahoney (marked *), and one from Mr. A. R. McEvey (marked **), plus notes on local occurrence by Mr. R. H. Green (see also Kershaw 1952).

AVES	***Phaps chalcoptera* (Lamarck, 1790)	Rare
MONOTREMATA	*Tachyglossus setosus* (Geoffroy, 1803)	Plentiful
MARSUPIALIA	**Macropus major* (= *tasmaniensis*) (Shaw, 1800)	Now absent from district
	**Wallabia rufogrisea* (Desmarest, 1817)	Plentiful
	Thylogale billardieri (Desmarest, 1822)	Plentiful
	Potorous tridactylus (Kerr, 1792)	Plentiful
	Bettongia cuniculus (Ogilby, 1838)	Plentiful
	Trichosurus vulpecula (Kerr, 1792)	Plentiful
	Pseudocheirus convolutor (Oken, 1816)	Plentiful
	**Cercartetus nanus* (Desmarest, 1818)	Apparently absent
	Isoodon obesulus (Shaw & Nodder, 1797)	Plentiful
	Perameles gunnii (Gray, 1838)	Plentiful
	**Antechinus swainsoni* (Waterhouse, 1840)	Apparently absent
	**A. minimus* (Geoffroy, 1803) or	Absent
	Sminthopsis leucopus (Gray, 1842)	Rare
	**Dasyurus viverrinus* (Shaw, 1800) or	Rare
	Dasyurops maculatus (Kerr, 1792)	Rare
	Thylaeinus cynocephalus (Harris, 1808)	Absent
	Sarcophilus harrisii (Boitard, 1841)	Rare

PLACENTALIA	**Mastacomys fuscus* (Thomas, 1882)	Absent
	Pseudomys higginsi (Trouessart, 1897)	Absent
	**Rattus* sp. *R. lutreolus* (Gray, 1841) [including *Mus velutinus* Thomas, 1882].	Plentiful
	**Nyctophilus* or *Chalinolobus* sp.	The former plentiful, latter rare.
	**Glischropus (= Falsistrellus) tasmaniensis* (Gould, 1858)	Not recorded
	**Pseudomys cf. novaehollandiae* (Waterhouse, 1843) [= *Gyomys* or *Leggadina* sp. in Green, 1967].	Not extant in Tasmania
MOLLUSCA	*Caryodes dufresnii* (Leach, 1815)	Common
	Strangesta ruga (Legrand, 1871)	Common

Mr. Green adds that his collection also includes numerous maxillary remains of small reptile species. It is interesting to compare the two collections. No *Petaurus breviceps* was found which may support the argument that this species was introduced from Victoria.

BIOGEOGRAPHY

Research on monotremes by Mr. J. A. Mahoney of the University of Sydney and myself has shown that the New Guinea echidna *Zaglossus* was present across the Australian mainland and in Tasmania during the Pleistocene, but later in that period disappeared so that *Tachyglossus*, a genus suited to drier environments, alone remained. The evolution of the species of *Tachyglossus* has not yet been worked out, but the Tasmanian species apparently owes its identity to isolation on that island. It is probably only 12,000 years since Tasmania possessed a land bridge to the mainland. This appears to be too short a time in which to evolve such a well defined species. If a number of fossil sites like that at Flowery Gully can be dated, it will be possible to study variation against time, and determine how much change has taken place in the past 12,000 years.

Thylacinus was also widely distributed over the mainland as well as in Tasmania during the Pleistocene, but it is now extinct or limited to the more inaccessible parts of Tasmania. *Thylacinus* is the largest of the known Australian marsupial carnivores, and was relatively common in Tasmania until early in this century when it suddenly became rare, perhaps as a result of an epidemic. The diseases of placentals introduced into this country are mostly too specific to be the cause, but this subject has yet to be fully investigated. Evolutional studies have still to be done on this genus, and it will be interesting to discover if the degree of variation against time is similar to that in *Tachyglossus* or that in *Macropus major* wherein only varietal changes have occurred.

Sarcophilus was present on the mainland up to 5000 years ago (Gill 1967) and probably much more recently than that, judging by the occurrence of bones in middens that appear to be of much younger age.

The rat kangaroos are represented by two species :

1. *Bettongia cuniculus*, a species restricted to Tasmania, and in ecology favouring grassy areas or stony outcrops on the edge of forests, as at Flowery Gully. The species is very close to *B. gaimardi* so much so that Wakefield (1967) believes it should be a subspecies of *gaimardi*.

2. *Potorous tridactylus*. When Europeans first came to Australia, this species was common in S.E. Australia but is now represented chiefly by the Tasmanian form. It may be that the natural process was a gradual diminution of the distribution until it remained in Tasmania only (as with other species already named), and that the process was hastened by human occupation, or perhaps its disappearance on the mainland is due to the imported fox, which does not exist in Tasmania. Some regard the Tasmanian *Potorous* as a subspecies of *tridactylus*, viz., *apicalis*.

The wallaby *Thylogale billardieri* is essentially a Tasmanian form but is found also in Southern Victoria. One early record from Mount Gambier extends the distribution just over the South Australian border. This wallaby frequents gullies such as that where Beams' Quarry is situated. The species was very numerous in the early days of European occupation, and appears to have been an important item in the nutrition of the Tasmanian aborigines.

The bandicoots are represented in the Flowery Gully fauna by two species :

1. *Isoodon obesulus*, the short-nosed bandicoot of very wide distribution in Australia. The Tasmanian form is slightly different but is not considered to have attained subspecific status.

2. *Perameles gunni* is a species of barred bandicoot found in Tasmania and a small area of S.W. Victoria. Insects and vegetable matter of various kinds constitute its diet.

The fossils include two possums :
1. *Pscudocheirus convolutor*, the specific status of which is questioned by many.
2. *Trichosurus vulpecula*, the very widely distributed brushtail possum, and the most adaptable of all Australian marsupials.

Indeed its occurrence over so vast an area as the Australian continent, and its acceptance of such varied sites for its nests as holes in trees, burrows in creek banks, ceilings of houses, indicates it to be the most resilient of all our native mammals.

The placental *Pscudomys higginsi* occurs widely in Tasmania, to which island this rat is limited.

PALAEOECOLOGY

The mammal fauna thus includes one monotreme, nine marsupials and one placental. The nine marsupials include two carnivores, while the remaining seven are herbivorous or of wider food habits. Ground and tree living forms occur; they inhabited forests or forest margins. A number of babitats is represented. All these animals did not live in the eave (or fissure) or just above the eave where their bones could be washed in, but were gathered from a range of localities. The gatherer was an animal predator or man. The fabric of the deposit suggested a midden rather than an animal lair, and this interpretation was supported by the finding of an aboriginal bone implement.

CHRONOLOGY AND CLIMATE

Radiocarbon dating had not been introduced into Australia when the sample was collected. However, some charcoal was retained as part of a matrix sample. This was not quite sufficient in weight for a radiocarbon assay, so the organic fraction of some bone fragments was added to make up the required amount. Professor K. Kigoshi of Gakushuin University, Japan, made the determination, reporting the age as 7080 $\pm$ 420 years B.P. (Gak-967).

Seven millenia ago the Wisconsin (Wurm) glaciers had retreated and the climate was not very different from the present. In a number of places in the world (including Australia) organic sedimentation had resumed in mountain tarns after the retreat of the ice. The sea was returning to its present order of level after its retreat from the continental shelves during the Last Glaciation (Fairbridge 1961). Thus at Badger Head on the north coast of Tasmania, stumps of small trees between present tide limits gave a radiocarbon date of c. 7380 years B.P. This period preceded the postglacial thermal maximum when the climate was warmer and drier in southern Australia, as is shown by lower lake levels, dessication of lake floors with building of parna dunes, and such like. These processes were particularly apparent in marginal areas, but were also well marked in Victoria (Gill 1953, 1964) and northern Tasmania (Nicolls 1958, Stephens and Crocker 1946).

Radiocarbon dates up to 8,700 years B.P. have been obtained for Tasmanian aboriginal sites, but it may be anticipated that older ones will be discovered.

BONE IMPLEMENT

The implement is the tip of a bone awl, reg. no. 49246 in the anthropological collection of the National Museum of Victoria, (Pl. 2-5). It is 4.3 cm. long and at its widest 1.3 cm. The thickest part of the broken end (away from the point) is 3 mm. The tabula of the bone from which it was made is present on three of the four sides of the broken end, while the fourth side, and the broken end itself, is completely occupied witb cancellous bone. The convexity of the side of the bone carrying the registered number, and the concavity of the opposite side, indicate that the implement was made from the flattish fibula of the type found in macropodids, and belonging to an animal the size of a kangaroo. It is not made from a human fibula because such are not flattened. The flattening of the macropodid fibula is at the distal end, and is accommodated to tbe curvature of the contiguous part of the tibia. This planate part was often used by the aborigines of both mainland and Tasmanian races for making awls, *muduks*, and nose bones. That the tip of the awl consists of compact bone indicates from which part of the distal end of the fibula it was made, viz., that part where the eancellous bone cuts out.

The convex side of the implement and the tip have been roughly pared and then partly smoothed. If the tip of the implement were originally symmetrical, as one would expect, then it has been broken longitudinally since it was made, but judging from the polish on the broken edges, especially towards and at the tip, the implement was used extensively after it was broken. Moreover, the break transversely across the implement is a comparatively recent one, so that it can be inferred that originally the implement was longer, and broke transversely after it broke longitudinally. Indeed the break is so fresh that it probably took place during the working of the deposit. Crowther (1925) and Meston (1949) have described bone awls from Tasmania. As the full width of the fibula was apparently used when the Flowery Gully implement was first made, it would be too wide for a nose bone and too big for a *muduk*. It can be accepted as the remains of an awl, which conclusion would be in keeping with such implements already known from Tasmania.

ACKNOWLEDGMENTS

Mr. W. F. Ellis, Mr. E. O. G. Scott, and Miss Joan Dixon kindly provided information.

Mr. M. R. Banks checked the site and provided the photo herein. The photos of the implement were taken by Mr. Frank Guy.

REFERENCES

CROWTHER, W. L. (1925). Notes on The Habits of the Extinct Tasmanian Race (1) The Uses and Manufacture of Bone Implements. *Pap. & Proc. Roy. Soc. Tas.* for 1924, pp. 136-139.

FAIRBRIDGE, R. W. (1961). Eustatic changes in sea level. In Ahrens, L. H., et al. *Physics and Chemistry of the Earth*, New York & London, vol. 4, pp. 99-185.

GILL, E. D. (1953). Geological evidence in Western Victoria relative to the antiquity of the Australian aborigines. *Mem. Nat. Mus. Viet.* Vol. 18, pp. 25-92.

GILL, E. D. (1964). Rocks contiguous with the basaltic cuirass of Western Victoria. *Proc. Roy. Soc. Vict.* Vol. 77, pp. 331-355.

GILL, E. D. (1967). Evolution of the Warrnambool-Port Fairy coast and the Tower Hill eruption, Western Victoria. Chapt. 15 *Landform Studies from Australia and New Guinea*, ed. J. N. Jennings and J. A. Mabbutt. A.N.U., Canberra.

GREEN, R. H. (1967). The murids and small dasyurids in Tasmania. *Rec. Queen Viet. Mus.* No. 28.

HUGHES, T. D. (1957). Limestones in Tasmania. *Miner. Resour. Tasm.*, 10.

KERSHAW, R. C. (1952). Notes on Marsupials at the Tamar River, Tasmania. *Vict. Nat.* Vol. 69, pp. 102-105.

MESTON, A. L. (1949). The Tasmanians — a summary. *Rec. Queen Vict. Mus.* Vol. 2, No. 3, pp. 145-150.

NICOLLS, K. D. (1958). Aeolian deposits in river valleys in Tasmania. *Aust. J. Sci.* Vol. 21, pp. 50-51.

STEPHENS, C. G., and CROCKER, R. L. (1946). Composition and genesis of lunettes. *Trans. Roy. Soc. S. Austr.* Vol. 70, pp. 302-312.

WAKEFIELD, N. A. (1967). Some taxonomic revision in the Australian marsupial genus *Bettongia* (Macropodidae), with description of a new species. *Viet. Nat.* Vol. 84, pp. 8-22.